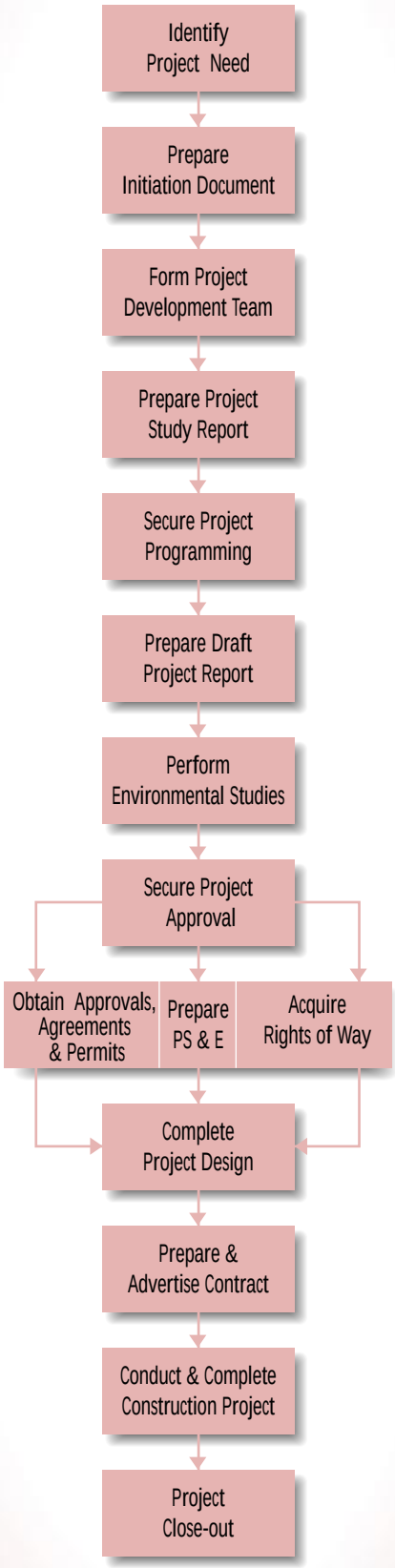
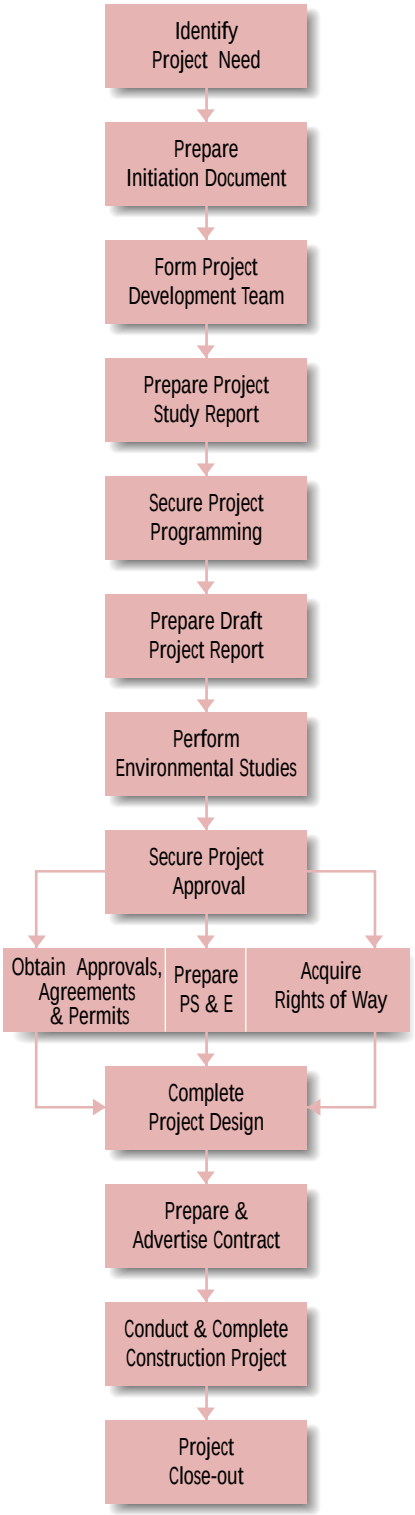
How Caltrans Builds Projects



October 1998

How Caltrans Builds Projects



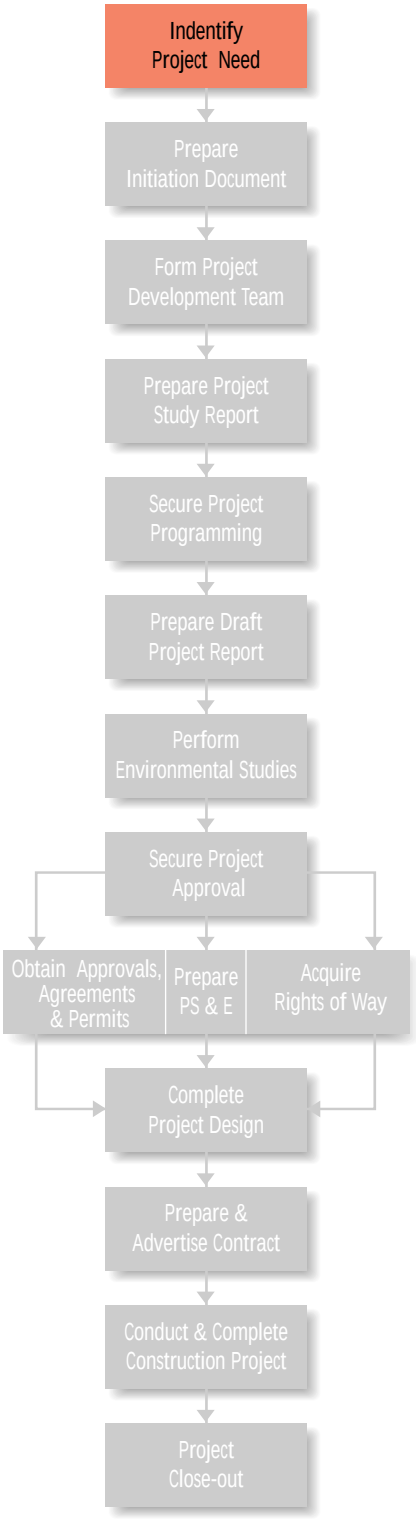
This Booklet

This booklet has been designed to step you through the Caltrans project development process quickly and easily. Its purpose is to provide general knowledge and to list resources on which you may draw to learn more, either by talking with a Caltrans district staff member or by obtaining manuals and guidelines. You may obtain the current list of manuals and guidelines from the Caltrans Publications Unit by calling (916) 323-5606, faxing to (916) 324-8997, or through the Internet at http://www.ns.net/caltrans/publicat.htm.

How Caltrans Develops Projects

The Caltrans project development process begins with feasibility studies and ends with a completed project. It melds engineering requirements, public involvement and federal and state approval steps, and is governed by a host of laws and regulations pertaining to programming, environmental effects, right of way acquisition and contracting for construction. Project development may take as little as a few weeks for an emergency project to restore interrupted transportation services, or decades, in the case of highly controversial projects involving relocation of large numbers of people and businesses or difficult environmental issues.

Many projects, even those that are limited in scope, can represent a severe intrusion on individuals and communities or a sensitive environment. The project development process has been designed through statute and regulations to provide many avenues for citizens and agencies to comment on project issues. Consideration of these issues may lengthen the process considerably.



How Projects Get Started

Considerable planning is done either by Caltrans or a local agency or both together, before project development starts. A need is identified, either as a structural or operating deficiency of the existing road, or as a response to planned land use changes such as a new subdivision, shopping or manufacturing center. Identification of such a need may result in a project as minor as a traffic signal or as major as a freeway.

If a major project such as a freeway or expressway is needed, Caltrans or a regional planning agency must perform studies to compare potential transportation investments before deciding what to build.

Caltrans management systems, master plans, and prioritizing processes identify projects. This work focuses on transportation problems and solutions. It establishes objectives and preliminary scoping. A feasibility planning estimate may be prepared to validate the project's objectives. At this point, a project is little more than a planning concept with location, length, and number of lanes and general interchange and intersection spacing identified.

Where to learn more

See Chapter 1, Section 4, and Chapter 3, Section 1, Caltrans *Project Development Procedures Manual*, *System Planning Guidelines*, *Project Management Handbook*, *Regional Transportation Plan Guidelines*; and the *Highway Capacity Manual*.

Your District Resource _____

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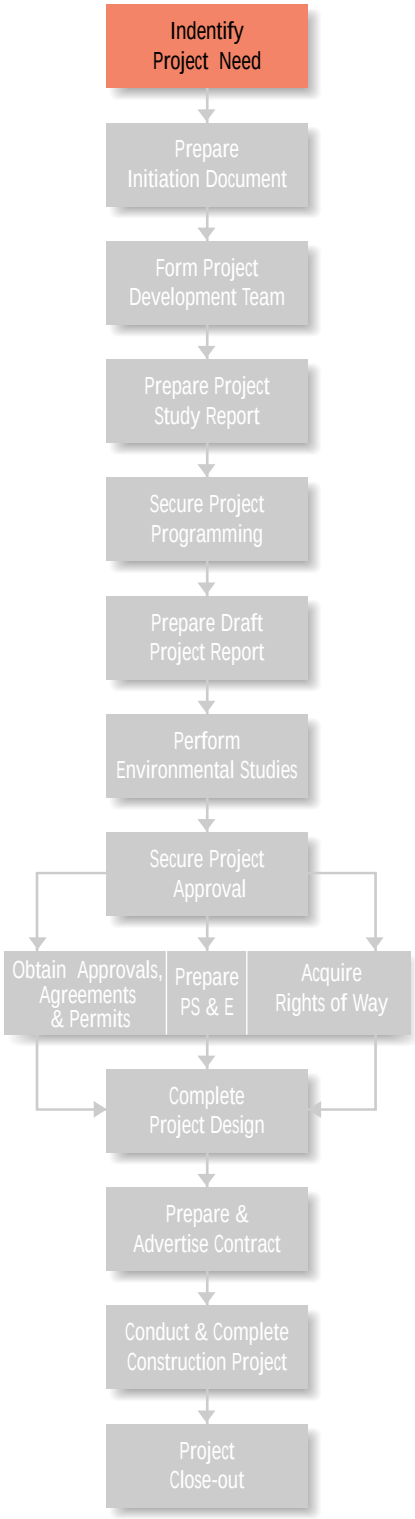

System and Regional Transportation Planning

Senate Bill 45, passed in 1997, placed 75% of STIP funds under the control of California's regional agencies. In the regions, projects are nominated by cities and counties for inclusion in Regional Transportation Improvement Programs. Projects compete with one another through a process that is established by the region. Caltrans districts assist the regional agencies, where requested to do so, in developing regional plans.

System and regional planning and the various management systems and master plans identify the need for projects. In the first stages of project development, the planning concept and scope including basic design features are reviewed and updated, if appropriate, to define the design concept and scope.

Why build it?

A project must satisfy a clearly defined need and purpose. It must meet State, regional and local goals and objectives and, for capacity-increasing projects, air quality goals. System planning is a start in defining a project's purpose, but project personnel should reexamine the project's purpose statement constantly. It will drive the project development and environmental processes and ultimate approval of the project, and is essential in getting public consent.

Where to learn more

See the Caltrans *Project Development Procedures Manual*, Chapter 1, Section 4, *NEPA/404 Guidance*, Federal Highway Administration, *Project Management Handbook*

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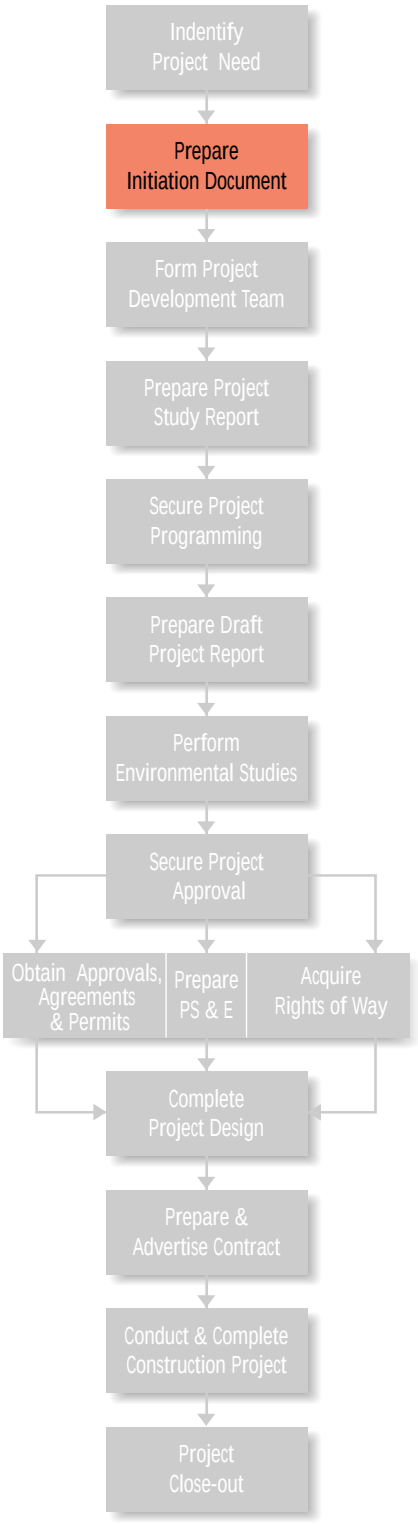

Decision to Prepare Project Initiation Document

Each district determines how it initiates projects, subject to various considerations including regional agency priorities. Before committing resources to a project initiation document, a district may prepare a one or two-page decision document discussing the feasibility of initiating the project. This document usually includes a strip map and feasibility planning estimate. All STIP projects require a Project Study Report or, in some cases, a Preliminary Scope and Study Report.

Project Initiation

Project Initiation should involve an analysis of major issues such as constructability and financing issues, railroad and utility involvement, traffic operations considerations, transportation management plans, environmental questions, and identification of individuals and institutions that are likely to be affected by the project.

Generally, the origination of any new project requires a Project Study Report (PSR) for larger projects, or Scope and Summary Report (PSSR) for smaller ones. A Project Study Report is a substantial document that contains a report of preliminary engineering efforts, a detailed alternatives analysis, and cost, schedule and scope information. A Project Scope and Summary Report is an abbreviated document that contains a very brief project description, cost, schedule and scope information, for a project that is exempt from detailed environmental study.

Project development starts when a Caltrans project manager is named and secures an expenditure authorization, then begins a project work plan to cover project initiation in detail. He or she determines the disciplines needed to develop the project and forms the project development team. At its first meeting, the team determines the project category to be used to prepare the project management plan.

Where to learn more

See the *Project Development Procedures Manual, Project Management Handbook*

Your District Resource _____

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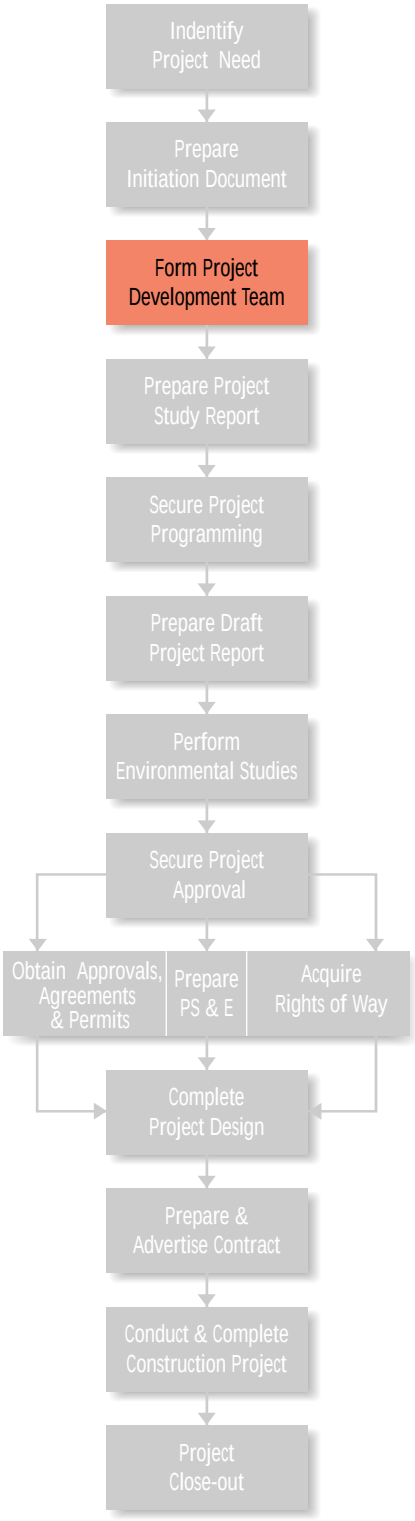

Form Project Team

Project teams employ different disciplines to develop and evaluate alternatives, help project managers direct studies, make recommendations and carry out the project work plan. Members of project teams participate in major meetings, public hearings and community involvement. They also serve as the nucleus for value analysis and are responsible for the conduct of studies and accumulation of data. For larger projects, more extended teams, called Project Development Teams, are formed. These consist of a wide range of disciplines and individuals from outside agencies and may even include representatives from community groups.

Project Team Functions

Project Teams:

- ensure design of a quality project that can be safely and efficiently constructed and maintained within scope and budget and on schedule.
- participate in a reevaluation of preliminary engineering data and systems planning recommendations to confirm that the study should continue.
- determine logical project limits.
- determine the need for participation of local, regional, State or federal agency members, or the need for advisory committees.
- recommend studies, timetables, alternatives, type of environmental document, and the feasibility of mitigation measures.
- call upon various disciplines as needed to ensure thorough analysis of the social, economic, environmental and engineering aspects of the project.
- initiate community involvement to obtain project consent and help plan public meetings and hearings.
- ensure that State and federal requirements are met.
- recommend a preferred alternative to district management.
- ensure that right of way is acquired and cleared on schedule.
- provide advice during construction.
- ensure that the project history is preserved

Where to learn more

See the Caltrans *Project Management Handbook*, *Project Development Procedures Manual*, Chapter 8, Sections 4 and 5,

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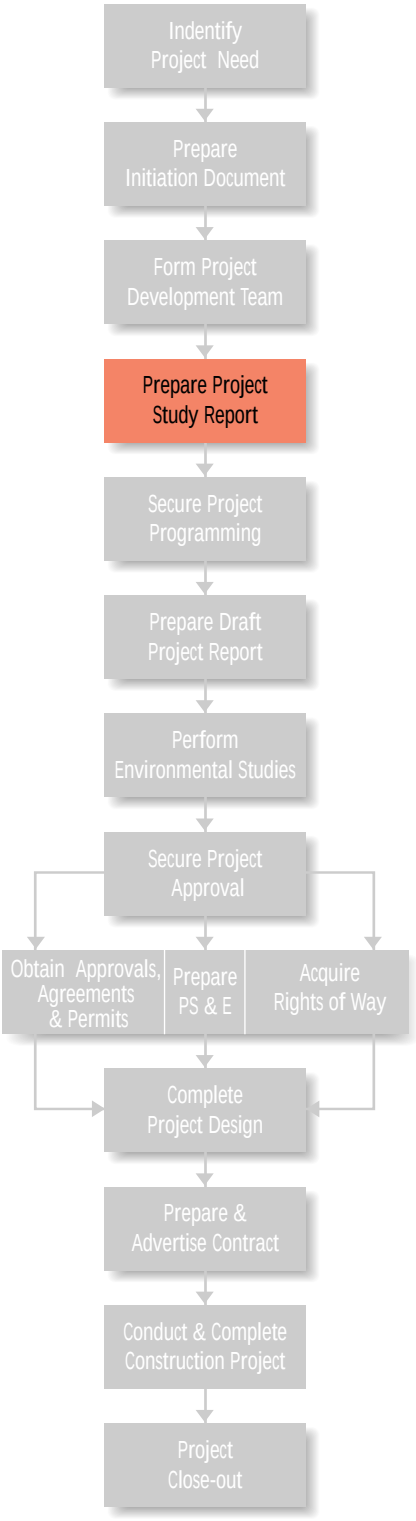

Prepare Project Initiation Document

Project Initiation Documents for larger, more complex projects are called Project Study Reports. Before a Project Study Report can be approved, sufficient information is needed to determine the project's cost, scope and schedule and whether or not the environmental document must consider alternatives. After Project Study Report approval and programming but before the start of environmental studies, geometric plans and R/W maps should be prepared in greater detail to identify areas of potential effects.

A Project Study Report that considers alternatives is usually required for projects that significantly affect the environment. The study of alternatives must include design concepts, multimode options, operational improvements, feasible avoidance alternatives and associated costs. From these, a practicable alternative is selected, and the cost, design concept and scope, and schedule are programmed.

Other processes are available to achieve project approval at this point for projects having a lesser impact on the environment. These include development of a Project Scope and Summary Report that incorporates a Categorical Exclusion/Exemption for pavement or structure rehabilitation projects to satisfy environmental requirements.

Where to learn more

See Chapter 9 of the Caltrans *Project Development Procedures Manual*, Caltrans *Work Breakdown Structure*, *Environmental Handbook, Cooperative Agreement Manual*, *Procedures Manual for Special-Funded State Highway Projects*; *Encroachments Permit Manual*; *Project Management Handbook*; *Highway Design Manual, Transportation Management Plan Guidelines*; *Major Damage Restoration Coordinator's Handbook, Photogrammetric Products and Services*.

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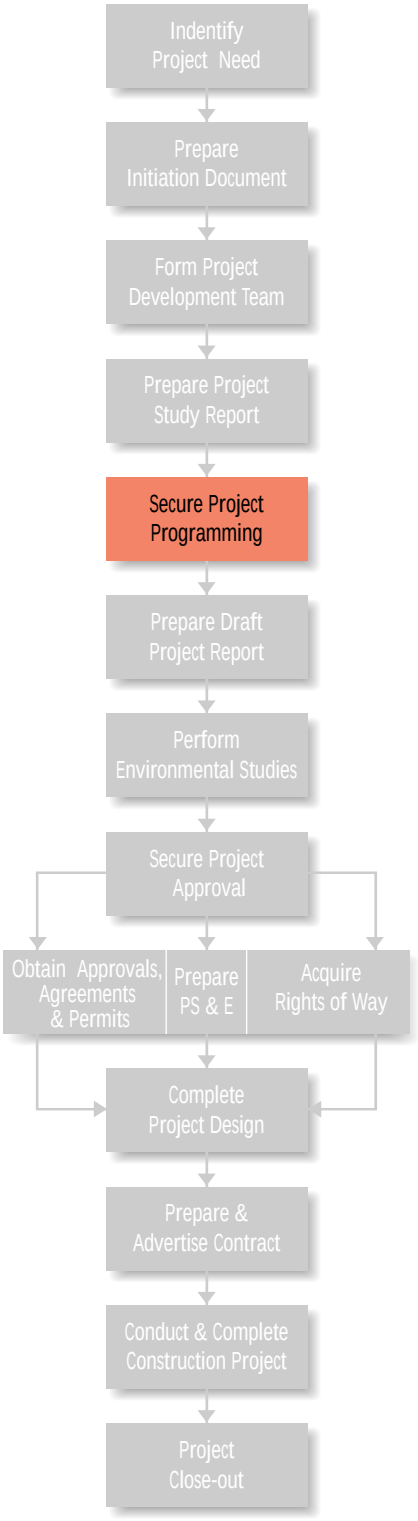

Programming

State Projects

Before formal project studies can commence for State-funded projects, the project must be programmed. Projects may be listed in the State Transportation Improvement Program or in the State Highway Operation and Protection Plan or various minor programs approved by the California Transportation Commission.

Regional Transportation Planning Agencies are responsible for decisions to program 75% or funds in the State Transportation Improvement Program. Twenty-five percent of STIP funds are nominated by Caltrans through the Interregional Transportation Improvement Program.

Specially Funded Projects

Specially funded State highway projects (locally funded, sales tax funded, or privately funded projects affecting State highways), new public road connections to freeways, or expressways requested by local agencies need studies that define the problem and identify basic solutions before they can be reviewed and included in a project delivery schedule or programming document. For Specially Funded Projects, an executed Cooperative Agreement or Highway Improvement Agreement is desirable before programming.

Local agencies program their specially funded projects in Expenditure Plans, Strategic Plans, Plans of Finance, or other documents that are similar to the STIP. However, when their projects involve State highway work, funding may be based on a commitment of funds from developers or establishment of an assessment district. Local agencies must prepare a project study report before a project can be approved in the STIP by the California Transportation Commission.

Where to learn more

See the Caltrans *Project Development Workflow Tasks Manual*, Caltrans *Local Programs Manual*, Caltrans *Special Funded Programs Procedures Manual*

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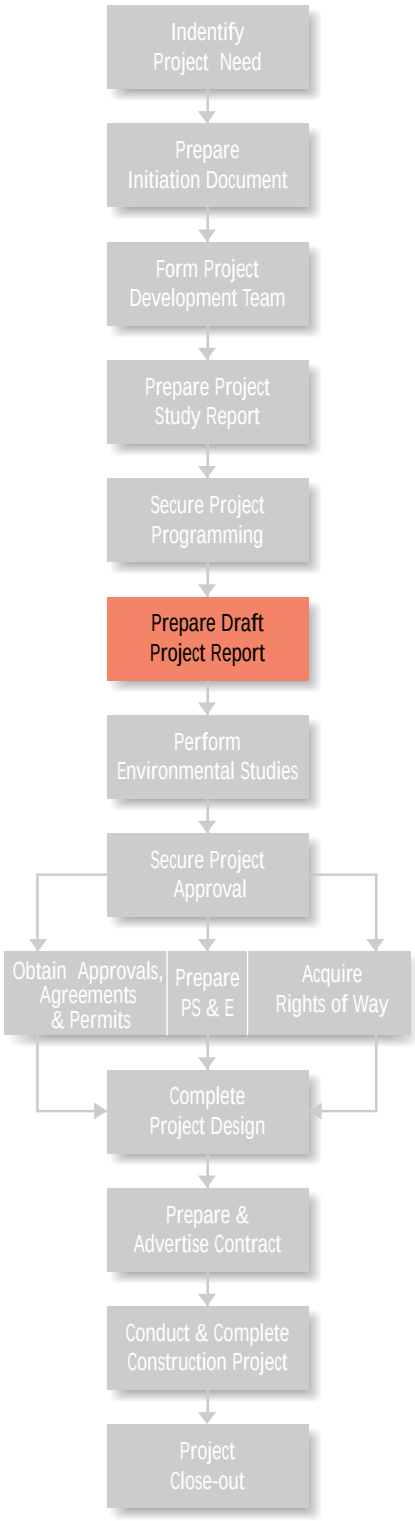

Prepare Draft Project Report

The basic document that provides information for decisions regarding a project's ultimate scope, schedule and cost is the Project Report. This report, based on preliminary engineering analysis, contains information about the project's background, need and purpose, alternatives investigated and issues encountered in the engineering and environmental investigations. Issues encountered may be environmental issues, air quality conformity, permits, right of way issues, traffic management plans, and various other engineering issues, and funding.

Activities in this phase include preliminary engineering and various studies, including surveys and mapping, traffic forecasts and modeling, value analysis, hydraulic studies, right of way and utilities impacts, railroad issues, materials and geotechnical information, and multi-modal issues.

Alternative Consideration

Value analysis is the preferred method to identify a minimum fundable and stageable alternative that minimizes costs and adverse environmental impacts and maximizes public benefits. The concept and scope of alternatives can include location, geometric features, mode or mix of modes, although mode or mix of modes should have been determined during system planning.

Most projects do not have significant environmental impacts, and thus no formal consideration of alternatives. These generally include traffic system management and rehabilitation and other projects with minor impacts and little controversy. For these, alternatives are considered informally and not addressed in the environmental document.

Alternatives that are studied in detail must comply with legal and administrative requirements and be technically and economically feasible. The depth of studies should be consistent with the scale of the project and its impacts. Studies should reflect the need for permits and consultation with other agencies and affected interests.

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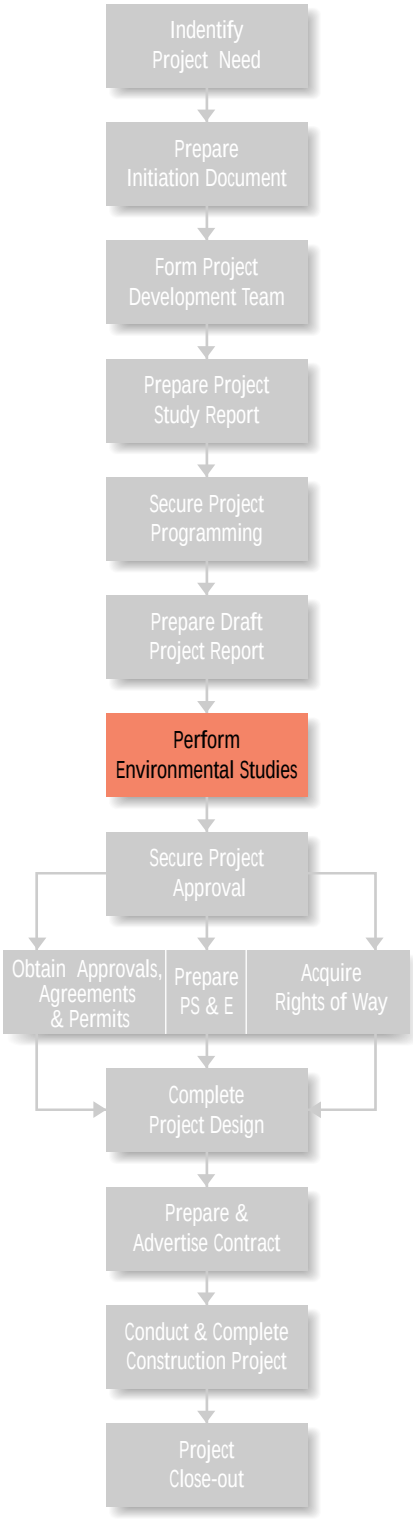

Environmental Studies

When environmental laws require formal consideration of alternatives, the full range of options must be addressed. The environmental document must outline the need and purpose and the reasons why certain alternatives were set aside. All significant adverse effects of each reasonable alternative must be identified and for each such effect, mitigation measures. The environmental document provides a record of the decision-making process.

Alternatives must be formally considered:

- When an Environmental Impact Statement or Report is prepared
- When an adverse impact is expected on:
  - –Endangered species
  - –Public parks, recreation areas, or wildlife and waterfowl refuges
  - –Historic sites
  - –Aquatic ecosystems, including wetlands
  - –Farmlands or agricultural preserves
  - –Floodplains
- When a hazardous waste site is expected to be impacted

Before starting the draft Project Report and environmental document, the project team should review the project alternatives and consider the need for environmental mitigation. Excessive mitigation costs or long-term mitigation maintenance may be a factor in discarding alternatives.

Effects that must be considered include those on the natural environment, architectural and cultural issues, social issues and hazardous materials, involving as many as a dozen separate studies. Less intrusive projects may achieve environmental approval with a short-form Categorical Exclusion/Exemption. If the environmental effects are minimal after mitigation but there is a need for public review, the project may be approved on a Negative Declaration/ Finding of No Significant Impact. More intrusive projects will require a full Environmental Impact Study/Report.

Projects must comply with all applicable environmental laws, including the Endangered Species Act, Clean Air and Water Acts, Wetlands Executive Order, Coastal Zone Management Act, and the National Historic Preservation Act and Section 4(f) regarding taking of parklands, historic sites and other sensitive lands. Compliance with these acts and other State and federal regulations is usually established in the environmental document after review by agencies with responsibilities in those areas.

Where to learn more

See Chapter 10 of the Caltrans *Project Development Procedures Manual*, Caltrans *Work Breakdown Structure, Environmental Handbook, Project Management Handbook, Highway Design Manual.*

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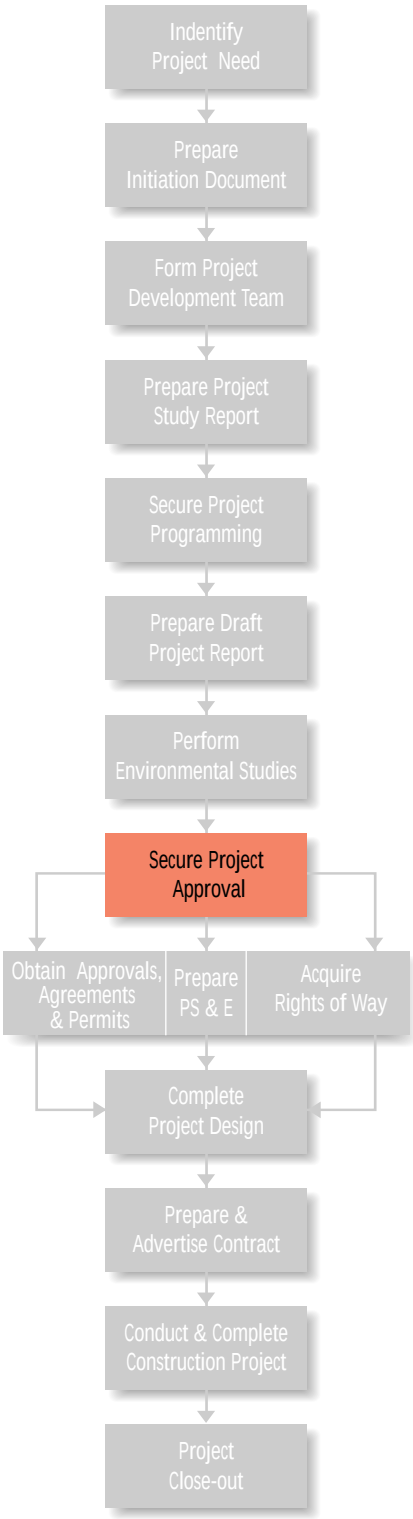

Project Approval/Environmental Approval

After the environmental studies for the practicable alternatives are complete, the Draft Project Report is approved, and the draft environmental document is circulated for comment. A preferred alternative is not usually recommended at this stage; however, if one is presented, the discussion of the preferred alternative should document factors considered in its selection.

The least environmentally damaging practicable alternative must be identified when a draft environmental document is prepared. If the "no-project" alternative is chosen, the draft document must identify it from among the "build" alternatives.

The extent of environmental review will vary with the complexity of the project and its effects on the surrounding environment. Procedural steps vary slightly depending on whether the project is federally financed. If the project is federally financed, all environmental studies must comply with the procedural requirements of the National Environmental Policy Act. If local or State-only funds are used, the project must comply only with California Environmental Quality Act procedures. In either case, the project must comply with all applicable State and federal laws and regulations, including the National Endangered Species Act.

Environmental documents that are subject to the National Environmental Policy Act require review and approval by the Federal Highway Administration. For a full Environmental Impact Statement, this may require more than a year of review and interagency coordination. The project team should communicate regularly and informally with those whom the project is likely to affect and secure their consent to project implementation. In addition, the project development process requires, for projects with significant effects, formal public comment, which may involve a public hearing.

Final Project Approval

After the project team has analyzed the public comments, it selects the preferred alternative, complete the final environmental document and attach it to the Project Report, which should also document selection of the preferred alternative and discuss changes in the project as a result of public comment. If federal funding is involved, the project must be approved by the Federal Highway Administration. A one-month waiting period is allowed after the FHWA has indicated its approval of the document to provide for opportunity for objections by other federal agencies or legal action by project opponents. If the project contains no federal funds, approval of the project is by the California Transportation Commission.

Where to learn more

See Chapters 11 and 12 of the Caltrans *Project Development Procedures Manual*, Caltrans *Work Breakdown Structure*, *Environmental Handbook; Project Management Handbook;* and *Caltrans Media Handbook* .

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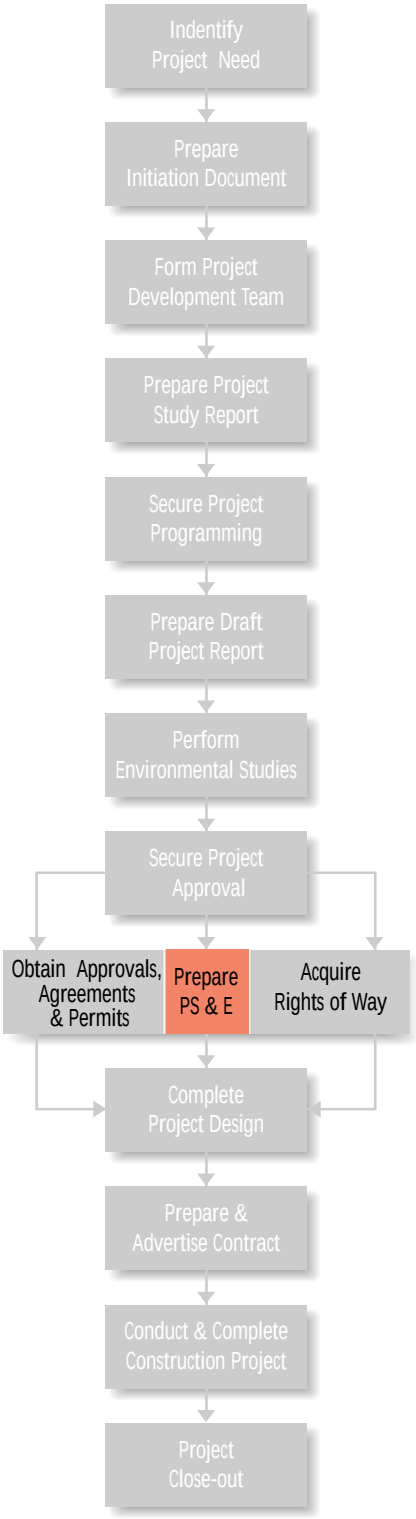

Prepare PS&E

Preparation of detailed Plans, Specifications and Estimates cannot begin until completion of project and environmental approvals. In this stage, project information is reviewed and updated, purpose and scope are refined, design surveys and photogrammetric mapping obtained, and reports including traffic data, hydrology and hydraulic, geotechnical design, pavement design, materials and soundwall design reports are completed. Final right of way requirements are determined, and pumping plant, special design culvert and bridge and structure site plans are prepared.

Issues to be Considered

Among issues to be revisited during detailed design are the following:

Railroads and Utilities

The design unit provides right of way with maps, profiles, and cross sections to determine railroad and utility involvement and for use in subsequent negotiations. Exceptions to the Caltrans encroachment policy must be submitted to Headquarters Design and Local Programs. If the project limits contain or are immediately adjacent to an existing railroad, the project manager should contact the Railroads Agreements section early in the design phase.

Traffic Operation

Caltrans policy requires consideration of high occupancy vehicle lanes for all capacity additions to metropolitan freeways or new metropolitan freeways, and at ramp meters where appropriate. Park and ride facilities must be considered for all new freeways, interchange modifications, lane additions, transit facilities, and high occupancy vehicle lanes. Transit facilities, including bus turnouts, passenger loading areas, benches and shelters, and traffic control devices should be considered where appropriate.

Transportation Management Plans

In general, a transportation management plan, whose purpose is to minimize construction-related congestion, is required for all reconstruction, rehabilitation, and other projects (including projects on the State Highway System not funded by the State), if construction work is likely to cause a significant increase in delay over an extended period.

Access to Navigable Waterways

Public access to any navigable river must be maintained. A navigable river is any body of water that requires a U. S. Coast Guard permit to cross.

Floodplains

Identify and discuss any impacts or encroachment on base (100 year) floodplains (usually considered in the environmental process). The project engineer is responsible for initiating the floodplain evaluation process.

National Pollutant Discharge Elimination System

Projects that disturb two hectares or more of soil are required either to obtain an individual permit or file for coverage under the general National Pollutant Discharge Elimination System permit that has been issued by the State Water Resources Control Board.

Where to learn more

See Chapter 14, Section 2 of the Caltrans *Project Development Procedures Manual, Caltrans Work Breakdown Structure, Highway Design Manual, CADD Users Manual, Drafting and Plans Manual, Traffic Manual, High Occupancy Vehicle Guidelines*; *Ramp Meter Design Guidelines, Project Management Handbook Standard Plans,* and *Standard Specifications, Plans, Specifications and Estimates Guide.*

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ACQUIRE RIGHT OF WAY

Acquisition

Acquisition of Rights of Way can begin only after completion of environmental clearance. Caltrans is required to purchase properties at fair market value, although some preliminary work, such as appraisals, can be started. Where the State cannot reach an agreement on price with an owner, Caltrans is allowed to request a condemnation action from the California Transportation Commission. An ordinary uncontested acquisition of a residential property is likely to take about eight months between appraisal and close of escrow. If an owner chooses to exhaust the condemnation process all the way to a court trial, such an acquisition can consume as much as two years or more. Right of Way considerations include the following:

Relocation Impact Studies

Relocation Impact studies are required on all projects that displace any person or business. A final relocation impact study will have been completed for the preferred alternative and included in the Final Environmental Document.

Airspace Lease Areas

The project development team should determine whether the proposed project has potential for future airspace leases. If so, and if the geometric plan can accommodate airspace leases, the district airspace committee is asked to review the appropriateness of incorporating such provisions into the project.

Right of Way Cost Data

Because right of way cost estimates are often time consuming, requests should be submitted to the district right of way branch as early as possible. Good mapping and other base data are important as their quality directly impacts the validity of the right of way cost estimates.

Where to learn more

See Section 10.05 of the Caltrans *Right of Way Manual.*

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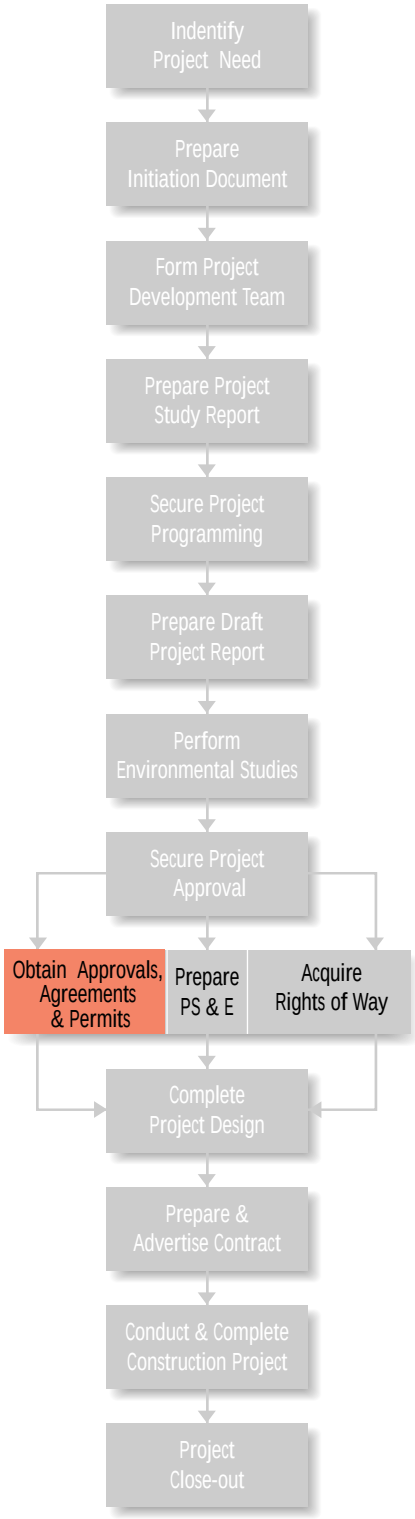

Approvals and Permits

Other agencies protect resources under their jurisdictions by requiring mitigation of project effects or through approvals and permits. Negotiations with other agencies occur throughout engineering and environmental studies, project approval, and design. Negotiations usually reach closure at about the time of project approval or shortly thereafter. Among the necessary permits and approvals, depending on the resources affected by the project, are:

Resource	Agency	Permit
Coastal Shoreline	Coastal Commission or City/County if authorized	Coastal Development Permit
San Francisco, San Pablo and Suisin Bays	San Francisco Bay Conservation and Development Commission	Development Permit
Lake Tahoe Watershed	Tahoe Regional Planning Agency	Project Permit
Floodways in the Central Valley	Reclamation Board	Encroachment Permit
Air	Air Pollution Control/Air Quality Management District U. S. Environmental Protection Agency	Authority to Construct and Permit to Operate Agreement on EIS
Fish and Wildlife Habitat	Department of Fish and Game U. S. Fish and Wildlife Agency National Marine Fisheries Agency	Stream and Lake Alteration Agreement Biological Opinion Biological Opinion
Water	State Lands Commission U. S. Army Corps of Engineers State Water Resources Control Board and Regional Water Quality Control Board Department of Health Services	Land Use Lease Section 404 Permit National Pollutant Discharge Elimination system Permit Waste Discharge Requirements for non-storm discharges Permit to Operate a Public Water system
Cultural Issues	State Historic Preservation Office	Concurrence with National Historic Preservation Act

Other agreements include Freeway Agreements with local agencies of government, Relinquishment agreements, Route Adoptions and Cooperative Agreements.

Where to learn more

See Sections 2-60 and 3-90 of the Caltrans *Project Development Procedures Manual* and the *Caltrans Environmental Handbook*.

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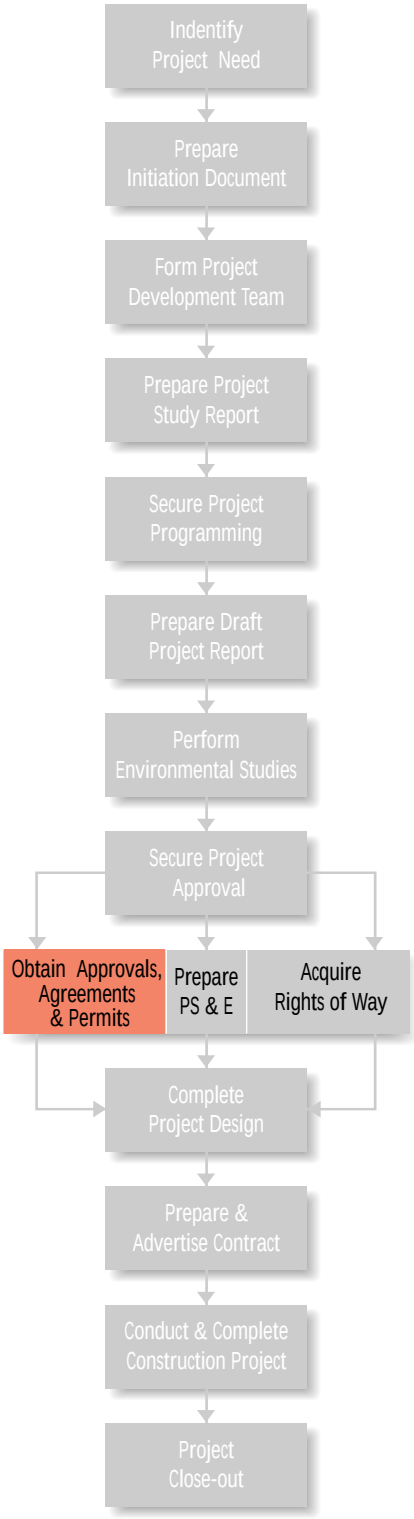

Agreements

Agreements required for major projects include freeway agreements, relinquishment agreements, cooperative agreements and maintenance agreements.

Cooperative Agreements

A Cooperative Agreement is an agreement between Caltrans and a city, county, or other non-State entity to cooperate in a project or share its costs. It outlines responsibilities and obligations such as liability, ownership, right of way, utilities, maintenance, etc. A project may require more than one agreement to cover any combination of planning, design, right of way, or construction.

Freeway and Controlled Access Highway Agreements

Local agencies must agree, in a Freeway Agreement or — for expressways, a Controlled Access Highway Agreement — before Caltrans is allowed to close a city street or county road as a result of construction. These agreements may cover the entire facility or any part of it that lies within the local jurisdiction.

Relinquishment Agreements

When a project results in Caltrans' ceding a portion of a state highway back to a local agency, State law requires that the facility be placed in a state of good repair before it can be relinquished to the local agency. The parties agree in a Relinquishment Agreement to the extent of rehabilitation of the road, miscellaneous alterations and corrections, installation of traffic signs, signals and delineation.

Maintenance Agreements

Maintenance Agreements are required when local forces work on Caltrans facilities. Maintenance agreements describe the activities and cover liability issues and financial arrangements.

Where to learn more

See Sections 2-60 and 3-90 of the Caltrans *Project Development Procedures Manual* and the *Caltrans Cooperative Agreements Manual*

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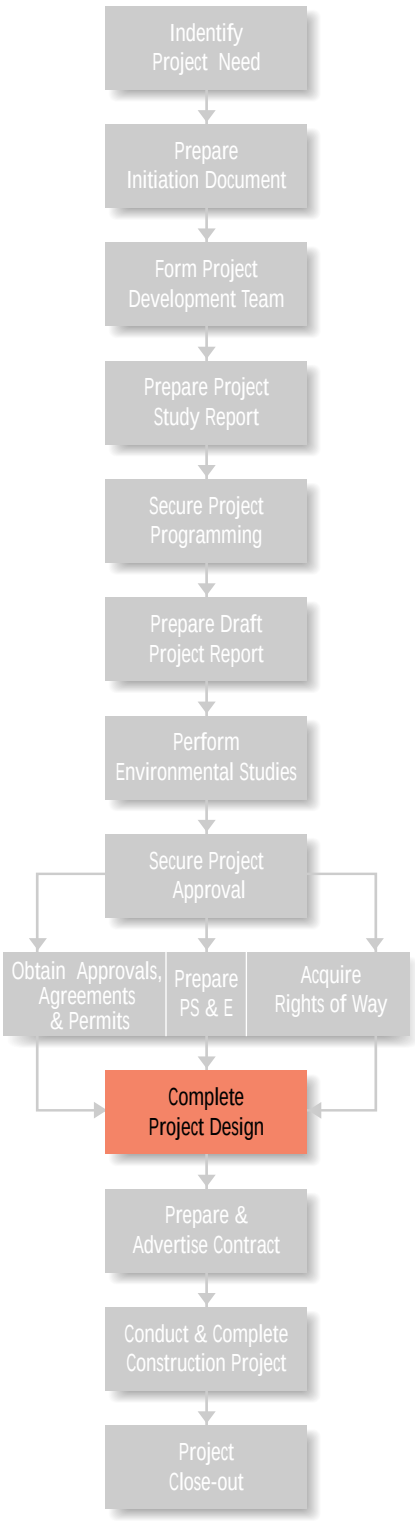

Complete Project Design

Final design begins after district comments have been returned and considered. A safety review, when applicable, is conducted, and plans, specifications and estimates are finalized. An environmental reevaluation should be conducted to confirm that the design conforms to the project report, and a constructabilty review conducted. Plans, specifications and estimates are then submitted to the district Office Engineer to be combined with Structures PS&E, then sent to the Office Engineer in the Engineering Service Center.

Where to learn more

See Chapter 14, Section 3 of the Caltrans *Project Development Procedures Manual*, *Caltrans Work Breakdown Structure*, *Highway Design Manual*, *Environmental Handbook*, *CADD Users Manual*, *Drafting and Plans Manual*, *Standard Plans*, *Project Management Handbook*, *Standard Specifications* and *Plans, Specifications and Estimates Guide*.

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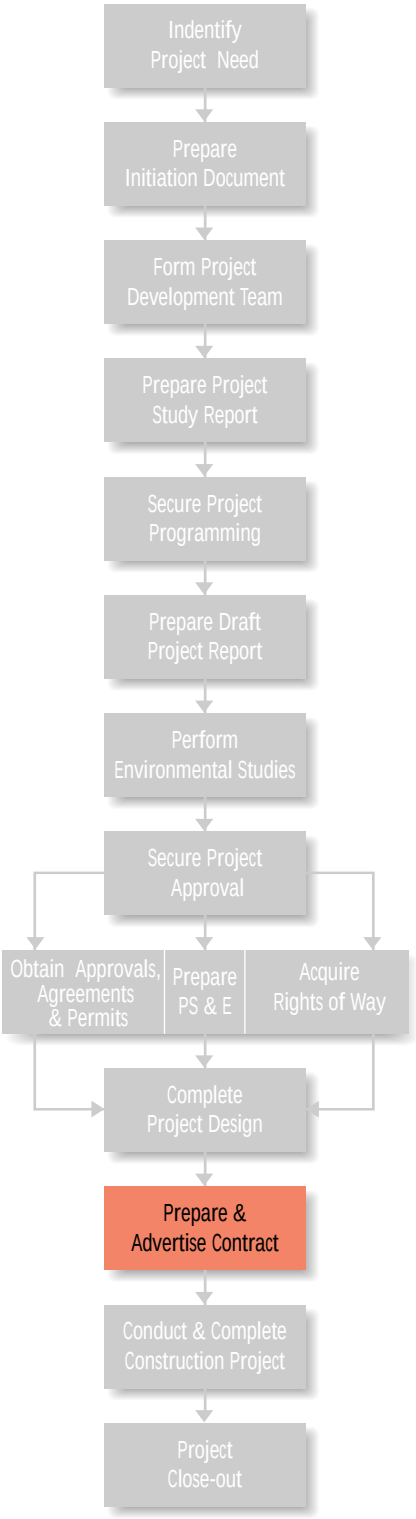

Prepare and Advertise Contract

At this stage, design is complete. The District Right of Way Office must certify that all needed properties have been obtained either by easement or acquisition, and all utilities have been taken care of. At this point, the California Transportation Commission must approve a fund request. The final project documents and bid package are then assembled for advertising. After bids have been opened, the project manager reviews the bidding process and recommends approval and award.

Where to learn more

See Chapter 14, Section 3, and Chapter 15, Section 1 of the Caltrans *Project Development Procedures Manual*, the *Project Development Workflow Tasks Manual*, *Project Management Procedures Manual*, *Construction Manual* and *Plans, Specifications and Estimates Guide.*

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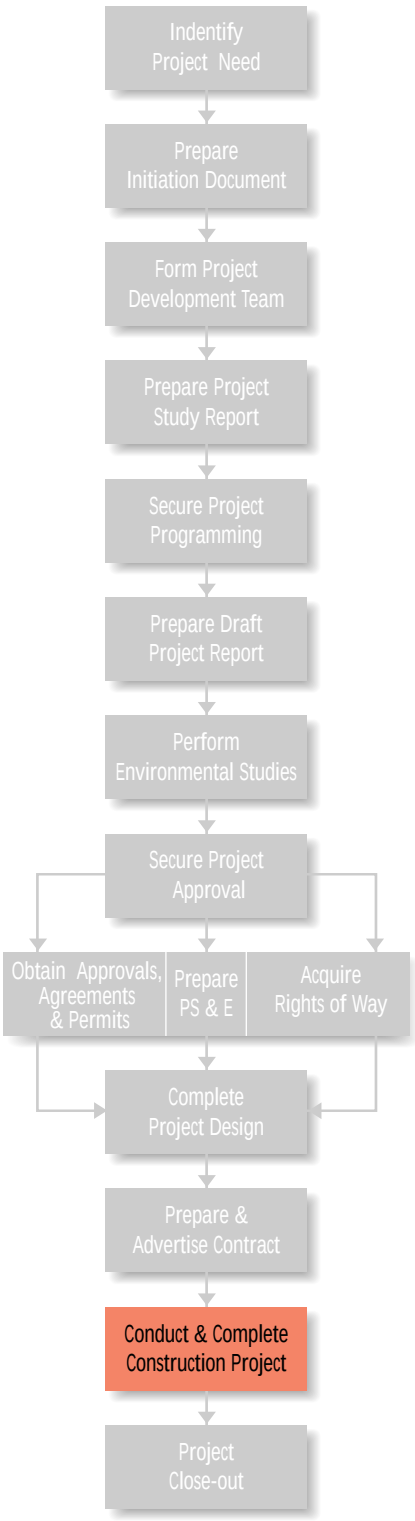

Conduct and Complete Construction Project

Contract approval authorizes construction of a project. If changes are required during construction, the project engineer will be asked to prepare engineering details and calculations as required. The resident engineer prepares the final construction project records when the project is complete. The project is not complete until the final contract estimate, project history file and as-built plans are completed, final right of way activities completed, claims are resolved and mitigation is completed.

Where to learn more

See Chapter 15, Sections 2 and 31 of the Caltrans *Project Development Procedures Manual*, the *Caltrans Work Breakdown Structure*, *Construction Manual* and *Project Management Handbook*.

Your District Resource _____

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Where to Find It

Function	Name	Phone	Request Mechanism
Filing System			
Planning			
Programming			
Project Management			
Environmental			
Traffic			
Surveys			
R/W			
Design			
Office engineer			
Maintenance			
Construction			